ARMCO-FERRO-MAYFLOWER HOUSE
Beverly Shores Century of Progress
Architectural District (moved from Chicago, IL)
251 Lake Front Drive
Beverly Shores
Porter County
Indiana

HABS NO. IN-244

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PHOTOGRAPHS

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Historic American Buildings Survey
National Park Service
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HISTORIC AMERICAN BUILDING SURVEY

ARMCO-FERRO-MAYFLOWER HOUSE

HABS No. IN-244

Location: 251 West Lake Front Drive, south side, Beverly Shores, Porter County, Indiana. Lot 8 in Block 188 of Robert Bartlett's subdivision Unit I.

Present Owner: National Park Service

Present Occupant: James and Diane Hadyon; David and Sharon Kemerer

Significance: The Armco-Ferro House is one of five houses from the Home and Industrial Arts Group moved at the end of the fair by Robert Bartlett to his lakeside subdivision at Beverly Shores, Indiana. In addition, this was one of six houses at the fair using steel construction with standardized pre-fabricated parts. The house was essentially frameless and contained no rafters, studs or joists. In addition, the house was used to showcase porcelain enamel for house siding, a new use for a material that had been used for more utilitarian purposes such as bathroom fixtures and kitchen appliances. This porcelain enamel house can be viewed as the predecessor to Lustron homes, three of which are located at Beverly Shores.

PART I. HISTORICAL INFORMATION

A. Physical History:

1. Date of erection: The chassis was erected on the site from pre-fabricted units in five days (unspecified date). The total building time including plasters, electricians, painters etc. was ten days. The house was dedicated by Rufus C. Dawes, Director General of A Century of Progress on 9 June 1933.

2. Architect: Robert Smith, Jr., Cleveland Ohio

3. Original and subsequent owners, occupants, uses: Original sponsors were the American Rolling Mill Company and the Ferro Enamel Corporation. After the close of the fair in 1934, the house was sold to Robert Bartlett who moved it to its current site in Beverly Shores, Indiana. In July 1942, Bartlett sold the house to Josephine Tomlinson and Anna Boyd Tomlinson. At some point between 1942 and 1948, the house was sold to Dr Michael H. Shuger and Ruth Stege Shuger. Ruth Steve Shuger died on March 18, 1967 and on May 29, 1969, her interest in the property was transferred to Michael H. Shuger. The U.S. Government purchased the house and property from Shuger on

August 23, 1976. Shuger retained a twenty-five year Reservation of Use that expires June 28, 2005. After Dr. Shugar's death the estate executor, Continental Bank, sold all of the the ROU to Mary Miller-Luxen, occupant of the House of Tomorrow, on September 28, 1977 for $7,533. (Porter County Book 71 p. 237). On August 27, 1982, Miller-Luxen filled out a Quit Claim that tranferred the ROU to James and Diane Haydon and David and Sharon Kemerer.

4. Builder, contractor, suppliers:

The house was built by Insulated Steel, Inc., Cleveland, OH, for the American Rolling Mill Company and the Ferro Enamel Corporation.

American Rolling Mill, Co., Iron and steel sheets
Cincinatti Mfg. Co., Screens in guest house
Ferro Enamel Corp., Porcelain enamel
Hillwood Manufacturing Co., Steel construction screws
Johns-Manville Sales Corp., Tile Wainscoting
Libbey-Owens-Ford Glass Co., Window Plate Glass
Parker Kahlon Corp., Sheet metal screws
Pan-American Wall Paper & Paint Co., Interior paint
Paint Products Laboratories, Caulking
P. & F. Corbin, Hardware
Sternberg Mfg. Co., Ornamental Iron Work
The Celotex Co., Insulation for walls, roof and ceiling
The Barrett Co., Roofing
Vitreous Enameling Co., Enameling and fabrication of exterior
Wood Conversion Co., Nu-Wood ceilings on second floor.

5. Original plans and construction: Original plans for the first floor show a garage with laundry facilities and a heater to the right of the entrance foyer. Circulation was to flow through the front door, into the living, dining and kitchen areas, through the rear entrance to the garage and then back through the front entrance from the garage before leading up the stairs to the second floor. A guardrail and raised platform in the garage were designed to control traffic. The house was actually built this way although the garage was converted to living space for the 1934 season.

6. Alterations and additions: For the 1934 season the garage was converted into a "man's study" and a storage area; the overhead garage door was replaced with a window. The overhang over the front entrance was removed and a large screened-in porch was added to the front facade. The porch covered the central and left front bays, adding asymmetry to an otherwise symmetrical design. Striped awnings replaced rounded overhangs on all of the windows on the main part of the house and awnings were removed from the solarium. For the 1934

fair, a guest house was added; after the fair it was moved to Main Street in Middletown Ohio.[1] A single-run staircase with a central landing was removed sometime after the 1934 season. Although it is configured much as it originally was, the kitchen has had all appliances replaced.

B. Historical Context:

In the winter and spring of 1934, sixteen buildings were brought by barge and by truck from the site of the 1933-34 Century of Progress Exposition to Robert Bartlett's subdivision at Beverly Shores, Indiana. In an attempt to capitalize on the fairs success, Bartlett reestablished a small exhibition of model houses along Lake Front Drive in Beverly Shores. Understanding the importance of the fair to Chicago and to Depression-era America is crucial for comprehending the significance of the houses for Bartlett and for those who purchased land at Beverly Shores. (See HABS No. IN-239)

1. Armco-Ferro House

a. History of the Ferro Enamel Corporation

The Ferro Enamel Corporation, one of the two major sponsors for the Armco-Ferro-Mayflower house, was formed in 1930 by a merger between the Ferro Enameling Company and the Ferro Enamel and Supply Co. The idea of using porcelain enamel for residential construction was introduced by Bob Weaver, president of the newly formed company. Shortly after the merger, Charles Bacon Rowley, architect, designed a four-person house with Ferro-Enamel shingles that the company erected in Cleveland, Ohio in July 1932.[2] Despite the innovative use of ferro-enamel as a cladding material, the house was built using conventional wood construction. The first porcelain-enameled frameless steel house was completed on Campus Drive in South Euclid, Ohio, a Cleveland suburb, on October 9, 1932. Like the Armco-Ferro-Mayflower house, this house was designed by Robert Smith, Jr. and was built by Insulated Steel Corporation; engineer Mills G. Clark collaborated on the design.[3]

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[1] "Six Model Homes go to market," Architectural Forum 63, no. 2 (February 1935): 181.

[2] Temple Hoyne Buell, "Community Planning with Transportable Houses," Architectural Record 75 (January 1934): 25.

[3] Albert Farwell Bemis. "Armco," The Evolving House, Vol. 3, Rational Design (Cambridge, MA: MIT Press, 1936), 343.

In 1932, the American Rolling Mill Company (Armco) of Middleton, Ohio built a second porcelain-enameled frameless steel house in the Cleveland suburb of Solon, Ohio using Robert Smith, Jr. as architect.[4] The Ferro Enamel Corporation and the Insulated Steel Construction Company collaborated with Armco, thus setting the stage for the partnership that made the Century of Progress home possible. The collaboration that allowed Armco to display its frameless structural system and Ferro Enamel Co. to exhibit its exterior siding continued in 1936 when the two companies erected a porcelain enameled building for the Great Lakes Exposition. The building was later moved to the Ferro Cleveland Plant where it is used as the engineering operations building.[5] Armco also offered its steel house with brick veneer and stucco exteriors.

b. The process of creating porcelain enamel:

To form porcelain enamel, a molten glass-like material is plunged into water that causes it to crumble, forming a substance called frit. The frit is ground with water, clay and color oxides and is then applied to steel panels. The coated panels are then heated to 1600 degrees, thus fusing the enamel to the steel. A display demonstrating this process was erected in the garage of the Armco-Ferro-Mayflower house at the Century of Progress Exhibition. The enameling for the Armco-Ferro-Mayflower house was done by the Vitreous Enameling Company, the same company that would later produce Lustron homes.

PART II. ARCHITECTURAL INFORMATION

A. General Statement:

1. Architectural character: The house is a modern design in that it has modern materials, a flat roof, geometric volumes, and very little applied ornament. Its symmetrical, rectilinear form and its firm base directly on the ground, however, make it appear more Art Deco than canonically modernist. In addition, it has traditional elements such as casement windows.

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[4] Buell, Temple Hoyne, "Community Planning with Transportable Houses," Architectural Record 75 (January 1934): 22.

[5] Ferro: the First Seventy Years 1919-1989, Reservation of Use Files, Park Headquarters, Indiana Dunes National Lakeshore, Porter, IN.

2. Condition of fabric: Fair. The enameled steel panels are rusting and some have become detached from the wall, exosing the insulation board. The roof appears to leak extensively.

B. Description of Exterior:

1. Overall dimensions: 34 x 24 feet

2. Foundations: Concrete slab foundation.

3. Walls: Belyx nails attach insulation board and an exterior sheathing of vitreous enamel to steel box-like units that form the main structural walls.[6]

4. Structural system, framing: The house was built using welded 20-gauge rolled steel box-like units formed from double reverse channel sections (six inches wide, two inches deep, wall height) lined with insulation board and covered with interior and exterior sheathing. Similar welded units are used for the floors; these, however, are made of 18-gauge steel, are ten inches wide and 5 1/2" deep. These units are Z-shaped and overlap one another until they end in an L-shaped unit that rests on a wire conduit channel. All of these channels join to form a metal chassis.

5. Porches, stoops, balconies, bulkheads: The house has a steel screened-in front porch set on a 6" concrete slab that was added for the 1934 season. Both back doors have metal overhangs supported by twisted metal strips.

6. Chimneys: A metal chimney is located outside the south-west corner of the solarium.

7. Openings:

a. Doorways and doors: The house has three main exterior doors. The front facade has a centrally located entranceway with a metal door. On the rear facade, one narrow metal door leads to what was originally the garage. Metal French doors with six lights each lead into the dining area. A fourth door on the south side of the solarium leads from the house to the roof deck.

b. Windows and shutters: The windows in the Armco-Ferro house consist of various arrangements of

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[6] Official Guide Book of the Fair, 1933, 68.

metal-framed casements and horizontally- and vertically-stacked fixed lights. Windows on either side of the main entrance consist of five vertically-stacked fixed lights. On the first floor of the front facade on either side of the central bay, a double casement window with four lights each is framed on both sides by four vertically-stacked fixed lights and across its top by four horizontally- arranged fixed lights. On the second floor, two double casements with four lights each are placed in the central bay; they are framed on the outer bays by single casements surrounded on both sides of four vertically-stacked fixed lights.

On the eastern bay of the first floor of the east facade, two casement windows with four lights each surround four fixed lights; this arrangement is capped by three fixed lights arranged horizontally across the top. A similar arrangement on the western bay consists of four vertically-stacked fixed lights suroounded on either side by casements and capped with three fixed lights. The first floor also contains one small double casement with three lights each; an identical window is found on the second floor directly above it. The second floor of the east facade contains a combination of casements and fixed lights similar to the one below it but without a cap of three horizontal lights.

On the first floor of the south facade, in between the two doors, two casement windows with three lights each are arranged on either side of three vertically-stacked fixed lights. On the second floor, paired single casements with four lights each are arranged in the central bay while the side bays contain double casement windows with four lights each located directly above the first-floor doors.

The west windows are the least complicated arrangement found in the Armco-Ferro house. They consist of two double casements with four lights each on the first floor located directly below identical windows on the second floor. One light of the lower right casement has been replaced with playwood and an electrical box.

The third floor solarium consists almost entirely of windows. Eleven windows consist of an arrangement of three lights, one fixed central pane

and two operable awning windows above and below. Each of the four sides of the solarium contains three of these combination windows except for the south side that contains two windows and a door to the deck. Each corner of the room has two tall fixed lights, one on either side of the corner.

8. Roof:

a. Shape, covering: The roof is a flat roof covered with tar. The original roofing material may or may not have been removed below the tar.

b. Cornice, eaves: The low parapet capped with green metal coping surrounds the roof deck and a horizontal green metal band runs around the base of the parapet.

c. Dormers, cupolas, towers: None.

C. Description of Interior

Interior decoration for the 1933 season was by Lois Palmer for Ladies' Home Journal and the furniture was provided by Kroehler Furniture Company.[7] For the 1934 season, the house was decorated by Mayflower Wallpapers and was referred to as the "Mayflower House."

1. Floor plans: The house consists of two main living floors and a third floor containing a solarium. One can circumambulate the entire first floor by entering the front door, turning left into the living room, right into the open dining area, right again into the kitchen, right once more into the storage area and the study, and right one last time to return to the entrance foyer and stairwell to the second floor.

The second floor consists of four bedrooms, a full bathroom and a small master bathroom with toilet, sink and shower. At the top of the stairs, the full bathroom is located straight ahead and a child's bedroom is placed to the right. A hallway runs around the stairwell with entrances to the master bedroom and its attached small bathroom and to the large guest bedroom. At the end of the hall is a small reading alcove and an entrance to a second child's bedroom. Stairs from the reading alcove lead to the third-floor solarium.

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[7] Official Guide Book, 1933, 68.

2. Stairways: A straight run stair with thirteen steps runs from the first to the second floor. The stairwell is painted and the steps are covered in rubbery black material. A chrome handrail runs the length of the stairs and a pattern similar to that on the exterior porch is found on the balustrade. A second straight run stair with thirteen steps and a chrome handrail leads to the third floor solarium. The steps are covered in a black synthetic material with aluminum nosing. A parapet forms the left side of the stairwell.

3. Flooring: Original floors in the living room, dining room and bedrooms were wood parquet laid over welded 16-gauge steel box-like units. Floors in the garage were concrete. Currently, floors in the living room, dining room, and study are low-pile carpeting. The kitchen has black and white vinyl square flooring and the storage room has terrazo squares. On the second floor, the master bedroom, the two children's rooms, and the guest bedroom have low-pile carpeting. Both bathrooms have terrazzo floors, green in the small bathroom and black in the large one. Vinyl squares line the floor in the hallway. The floor of the third floor solarium is covered with terrazo-patterned vinyl squares.

4. Wall and ceiling finish: Originally, interior walls were wall board and plaster with Micarta baseboards. The boards were attached to the steel using screw-threaded nails. Walls in the kitchen and bathroom were linoleum. Currently, walls in the dining room, living room and study are painted over plastered wall board; in the kitchen plastered wall board is found above a wainscot of black tile. On the second floor, the master bedroom, the guest bedroom and the rear child's bedroom have fabric applied over wallpaper. Both bathrooms have tiling, green in the main bathroom and white in the small master bathroom. The front child's bedroom is painted over plastered wall board and the hallway is covered with pickeled wood paneling. The walls on the third floor solarium are plastered wall board.

The ceiling in the dining room is the most decorative in the house. It consists of nine segments with corner blocks in raised geometric patterns. Two of the nine segments are filled in with overhead light fixtures. The ceiling in the kitchen and the living room is covered with white square acoustical tiles. The ceilings in the study and in the storage room are flat. The study ceiling seems to be plaster while the storage room ceiling appears to be made of metal. Dropped rectangular acoustical tiles cover the ceiling in the stairwell and

the second floor hallway. All four bedrooms have ceiling tiles identical to those in the kitchen and living room. Both bathrooms have flat painted ceilings. In the third-floor solarium, the structural steel boxes that form the roof are exposed.

5. Openings:

a. Doorways and doors: There are doors between the study and the storage area, between the storage area and the kithchen, and between the kitchen and the dining area. There are hinges for a door between the study and the entrance hall but there is no existing door. The living room and dining room open onto one another through a large rectangular opening. On the second floor, all of the bedrooms and bathrooms have standard doors.

b. Windows: There are no interior windows.

6. Decorative features and trim: Decorative feature and trim are kept to a minimum in keeping with the aesthetic of modern design.

7. Hardware: Original hardware was supplied by P. & F. Corbin. Most doors have standard metal doorknobs.

8. Mechanical equipment:

a. Heating, air conditioning, ventilation: Original heat was electric forced air. This is still the case with floor and wall vents scattered throughout the house. The washer/dryer, hot water heater and General Electic heater are located in the storage room.

b. Lighting: The dining room is lit by two overhead lights. The living room has one overhead light close to the entrance hall and is otherwise lit using floor and table lamps. The kitchen has track lighting with exposed light bulbs and the laundry room has an overhead fixture. The second floor hall has two overhead fixtures in the hall. All other lights are table and floor lamps or wall sconces. The third-floor solarium has an overhead light fixture.

c. Plumbing: Original plumbing was of hard copper tubing. Both of the bathrooms have toilets with overhead flush boxes and exposed pipes. The toilet in the full bathroom did not originally have

exposed pipes.[8] Gomerville pipes can be accessed through a closet in the rear bedroom.

9. Architectural furniture: Four floor-to-ceiling bookcases line the walls of the study. These were added when the room was converted from a garage for the 1934 season of the Century of Progress Exposition. There are built in closets in all of the bedrooms, a linen closet in the second-floor hall and a small closet in the study.

D. Site:

1. Historic landscape design: At the Chicago Century of Progress Exposition, the original landscape for the Armco-Ferro-Mayflower house was designed by James W. Owen who abandoned curves in favor of simple, straight lines. Owen divided the usable lawn into several sections including a drying area and a chilren's play area with an enamel-coated wading pool and an enamel-shingled pergola. Green shrubs were grouped close to the house while flowering trees and flowers accented the surrounding area and evergreens filled the side yard.

The house was moved to Lake Front Drive in Beverly Shores from its original site along with four other houses from the Home and Industrial Arts Group. Before the move, Robert Bartlett expressed plans "to reconstruct and landscape them for sale exactly as they were on the Fair grounds."[9] According to a contemporary article, Bartlett appears to have specific landscaping in mind; "The homes will be reconstructed along Lake Front Drive in Beverly Shores in a permanent location, especially landscaped to suit each particular type of architecture."[10] Despite these claims, Bartlett neither replicated the exact fair siting nor did he appear to have created a landscaping scheme adapted to each house. By grouping the five houses together, however, he managed to recreate a sense of an "exhibition group" at Beverly Shores.

Three houses, which includes the Armco-Ferro house, are lined up across the street from the lake at the top of a dune. A retaining wall at street level runs the length

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[8] Raley, photo 24.

[9] "Six Model Homes Go to Market," Architectural Forum 62, no. 2 (February 1935): 181.

[10] "Modern Homes to Be Moved to Beverly Shores," newspaper article in Ann Carlson's scrapbook, Beverly Shores, Indiana.

of the Armco-Ferro house, the Cypress Log Cabin, and the House of Tomorrow. A flight of twenty-seven stairs in front of each house leads to a catwalk that runs east/west and connects the three houses.

This rigid geometric site is quite different from the original arrangement of the hous. The Armco-Ferro house is oriented much as it was at the fair where it was sited across the street from the lake with its main facade facing toward Leif Erikson Drive. Its relationship to the buildings around it, however, was altered significantly when it was moved to Beverly Shores. At the fair, the Design for Living exhibit, a building of comparable size, was located to the left of the Armco-Ferro house. Directly behind were the General Houses and Stransteel exhibits; these four houses formed a square of model houses. To the right of this self-contained group, adjacent to the Armco-Ferro house, was the colossal Home Planning Hall, the central building of the Home and Industrial Arts Group. Much greater in scale than all four of the houses put together, this building dominated the surrounding space. In contrast, the site at Beverly Shores with its regularly spaced stairs and unifying retaining wall sets up a nonhierarchical relationship between the Armco-Ferro House, the Cypress House and the House of Tomorrow.

2. Outbuildings: At the fair site, a guest cottage was added for the 1934 season; after the fair it was moved to Main Street in Middletown Ohio.[11] There are currently no outbuildings on the site.

PART III. SOURCES OF INFORMATION

A. Architectural Drawings: A rendering of the proposed Armco-Ferro house is reproduced in Joseph C. Folsom, "The Fireproof Steel House May Be Industry's Next Big Job."

A plan produced by Robert Smith, Jr. office-at Park Headquarters. Photograph of same plan at Kemerers'. From University of Chicago, Illinois. Dated December 7, 1932.

B. Early Views:

A photograph of the house reproduced in The Official Pictures of A Century of Progress Exposition. Chicago: Reuben H. Donnelley Corporation, 1933. This view shows the house at it

[11] "Six Model Homes go to market," Architectural Forum 63, no. 2 (February 1935): 181.

was originally built. A garage was located in the left bay of the house. Access was via an overhead door on the front of the house and a narrow door in the rear. There was an overhang suspended by twisted metal bands over the main entrance to the house similar to the overhangs over the two back doors.

A 1934 postcard from the exposition. This view shows the changes that were made between the 1933 and the 1934 season. The garage was converted into living space and the overhead garage door was replaced with a window. The overhang over the front entrance was removed and a large screened-in porch was added to the front facade. The porch covered the central and left front bays, adding asymmetry to an otherwise symmetrical design. Striped awnings were added to all of the windows on the main part of the house and were removed from the solarium. The postcard also shows an exterior staircase running from the roof decks to the ground; it no longer exists.

A photograph ca. 1936 showing the Armco-Ferro house and the House of Tomorrow on their new sites in Beverly Shores. In collection of David and Sharon Kemerer, ROU Armco-Ferro House, Beverly Shores, Indiana.

C. Interviews: none.

D. Bibliography:

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Chapple, Bennett to Wayne O. Axtell. 11 September 1931. Special Collection, Richard J. Daley Library, University of Illinois at Chicago, Chicago.

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"Frameless Steel House at A Century of Progress." Promotional brochure. 1933. Special Collection, Richard J. Daley Library, University of Illinois at Chicago, Chicago.

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Wright, Hugh W. to J.C. Folsom. 1 July 1933. Special Collection, Richard J. Daley Library, University of Illinois at Chicago, Chicago.

E. Likely Sources Not Yet Investigated:

Ryerson/Burnham libraries at the Art Institute of Chicago (closed summer 1994).

F. Supplemental Material:

Map showing location of Home and Industrial Arts group on fair site. From 1934 Souvenir Map. Collection of David and Sharon Kemerer. Reservation of Use holders of Armco-Ferro House, Beverly Shores, IN.

Map showing layout of Home and Industrial Arts group. From "The Modern Houses of A Century of Progress," The Architectural Forum July 1933, 51.

Chart showing "scientific" research on girder span. From "New Materials and Building Methods" Architectural Record April 1932, 282.

Exterior view of Armco-Ferro House as it appeared in 1933

season. Unknown source. IN PARK FILES.

Exterior view of Armco-Ferro House as it appeared during 1934 season. Raley, Dorothy, ed. A Century of Progress: Homes and Furnishings. Chicago: M.A. Ring Company, 1934, 16.

First and second floor plans, exterior view and construction detail. From "The Modern Houses of A Century of Progress," Architectural Forum July 1933, 54.

View of Armco-Ferro and the House of Tomorrow on their sites in Beverly Shores. Historic Preservation News. February/March 1994.

PART IV. PROJECT INFORMATION

Documentation of the Beverly Shores Century of Progress Homes and Historic District was undertaken in the summers of 1993 and 1994 by the Washington Office of the Historic American Buildings Survey (HABS) of the National Park Service, Robert J. Kapsch, HABS/HAER Division Chief, and Paul D. Dolinsky, Chief of HABS. The project was cosponsored by the Midwest Regional Office of the National Park Service, Andrew Ketterson, Chief of Cultural Resources and Craig Kenkel, Regional Historic Architect. Additional support was provided by Indiana Dunes National Lakeshore, Dale Engquest, Superintendent and William Supernaugh, Assistant Superintendent.

The project was directed by Frederick J. Lindstrom, HABS Supervisory Architect. The field documentation was completed by Project Supervisor, Judith E. Collins and Field Foremen: Joseph A. Boquiren and Laura J. Culberson, with Architecture Technicians: Bert V. Calhoun, II, Eric T. Helgoth, David M. Lefton, Michael J. Seibert, Lillian M. Smith and Lori A. Smith. The historical report and written building surveys were produced by Project Historian Maria F. Ali, under the direction of Catherine Lavoie, HABS Senior Historian and Sarah Allaback, HABS Historian. The large format photography was produced by HABS staff photographer Jack E. Boucher in 1994. Recognition must also go to the individual residents of the houses and the staff of Indiana Dunes National Lakeshore for their cooperation and assistance.